T-45 TRAINING SYSTEM (T-45TS)

Navy ACAT IC Program		**Prime Contractor**
Total Number of Systems:	187	Boeing
Total Program Cost (TY$):	$5.96B	
Average Unit Cost (TY$):	$25.8M	
Full-rate production:	2QFY95	
SEP Production:	3QFY99	

SYSTEM DESCRIPTION & CONTRIBUTION TO JOINT VISION 2010

The T-45 Training System (TS) is an integrated training system with five main subsystems: the T-45A aircraft, flight simulators, an academics package, the Training Integration System, and contractor logistics support. The T-45TS is intended to provide Navy intermediate and advanced student jet flight training, replacing the T-2B/C and TA-4J aircraft and associated training systems.

The T-45A Goshawk, a derivative of the existing British Aerospace Hawk, is a tandem-seat, light-weight, single-engine aircraft modified for aircraft carrier operations. It incorporates an onboard oxygen generating system, a heads-up display, and a weapons delivery capability for training.

The ***Simulator Subsystem*** includes the 2F137 instrument flight trainer and 2F138 operational flight trainer. The 2F138 is a ground-based flight simulator equipped with a wide-angle visual display system. The 2F137 is essentially a 2F138 without the visual display system.

The ***Academics subsystem*** is intended to provide a totally integrated multi-media system capable of training students and instructors under training. Classroom lectures, workbooks, computer-aided instruction, training devices, and audio-visual media are integrated with the simulator and flight training phases.

The ***Training Integration System*** is a management information system using computer hardware, software, communications, and peripheral equipment to facilitate efficient scheduling and use of all training resources (including instructors and students), maintain student and instructor records, and manage curriculum and student flow.

The T-45TS is intended to support the ***Joint Vision 2010*** objectives of preparing joint warriors to meet the challenges of future battlespace by ensuring that they are properly trained.

Contractor support will be provided for all levels of maintenance and logistics for the T-45TS subsystems. The integrated logistic support resources will be established by the contractor, funded by the Navy, and turned over to the contractor for integrated logistic support management.

The digital Cockpit 21 upgrade to the T-45A, now designated T-45C, involves replacement of dedicated gauges and data entry panels with two 5-inch square, monochrome multifunction display units in each cockpit. In addition, a dual redundant MilitaryStandard-1553B multiplex data bus is incorporated, along with integration of a display electronics unit and removal of some single purpose analog hardware. A combined Global Positioning System /Inertial Navigation System replaces the standard attitude and heading reference system. Software modifications include improvements to the Heads Up Display in the front cockpit.

BACKGROUND INFORMATION

The T-45TS entered EMD in 1984. Initial operational testing (OT-IIA) in November 1988 identified several major deficiencies in aircraft handling qualities during carrier waveoffs and missed arrested landings. Consequently, the program acquisition schedule experienced several slips to allow for redesign of the aircraft by Boeing (then McDonnell Aircraft)—the prime contractor. Subsequently, OT-IIB in 1990 and OT-IIC in 1991, verified improvement of the identified performance deficiencies. The T-45TS was determined to be both operationally effective and operationally suitable, and recommended for fleet introduction during OT-IIC (OPEVAL) in May 1994.

Future activity in the program will consist of an evaluation of the effectiveness and suitability of the Cockpit 21 digital upgrade to the T-45TS. The Navy has incorporated this engineering change to new production aircraft—designated T-45C—and has modified an existing flight simulator to the Cockpit 21 configuration. There are also plans to eventually retrofit the existing T-45A aircraft.

The OT&E of the T-45TS has been conducted in compliance with TEMP Revision 6, which is current and most recently approved by DOT&E on July 8, 1997. This TEMP supports OT-IIIA, the OPEVAL of the Cockpit 21 upgrade.

TEST & EVALUATION ACTIVITY

OT-IIIB, OPEVAL of the Cockpit 21 upgrade, was completed in August 1998 at NAS Meridian. Previous deficiencies with directional stability, engine surge and "pitch buck" are not corrected with the Cockpit 21 upgrade and still exist. Testing of the Cockpit 21 simulator, the second part of OT-IIIB, was also completed despite being slowed by significant technical issues. Reevaluation of the Operational Flight Trainer (OFT) was recommended and is ongoing by COMOPTEVFOR.

TEST & EVALUATION ASSESSMENT

From the OPEVAL, DOT&E assesses that the T-45C computer-assisted instruction (CAI) and Training Integrated System is both operationally effective and suitable. DOT&E also assesses that the operational flight trainer was not operationally effective or suitable because of multiple problems, including visual replication, configuration and flying qualities, compatibility, and poor reliability. The T-45 OFT does have training utility, but does not accurately represent the aircraft in several areas. Limited fleet introduction of OFT 7 was recommended after multiple deficiencies were corrected. Most of the deficiencies have been resolved satisfactorily. Re-evaluation by COMOPTEVFOR is ongoing. OFT 9 is now the baseline software.